

Claims

1. Method for determining whether a substance is a modulator of a target component in a cell, comprising
5 the steps of:
 - (a) preparing a cell, which contains the target component, immobilized on an extracellular potential-sensitive electrode,
 - (b) bringing a substance to be tested in contact with
10 the cell, in a medium which has a salt concentration of $\leq 100 \text{ mmol/l}$,
 - (c) measuring a signal at the electrode due to the target component, and
 - (d) determining the effect of the substance to be
15 tested on the measurement signal.
2. Method according to Claim 1 for determining whether a substance is a modulator of a membrane-associated target component.
3. Method according to Claim 1 or 2 for
20 determining whether a substance is a modulator of an ion-channel/receptor system.
4. Method according to Claim 3, characterized in that the ion-channel/receptor system contains a voltage-controlled, ligand-controlled or mechanically controlled ion channel.
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5. Method according to Claim 4, characterized in that the ion channel is a potassium channel.
6. Method according to Claim 5, characterized in that the potassium channel is selected from hSlo and
30 KV1.3.
7. Method according to Claim 3 or 4, characterized in that the ion-channel/receptor system contains an NMDA, GABA, AMPA or acetylcholine receptor.
8. Method according to one of the preceding
35 claims, furthermore comprising stimulation of the target component in the cell.
9. Method according to Claim 8, characterized in that the stimulation of the target component comprises

electrical, optical or/and chemical stimulation.

10. Method according to Claim 9, characterized in that the stimulation of the target component comprises the application of a DC voltage or an AC voltage.

5 11. Method according to one of the preceding claims, characterized in that the cell is in contact with an additional electrode, for example a patch clamp.

12. Method according to one of the preceding 10 claims, characterized in that the potential-sensitive extracellular electrode is arranged on a chip.

13. Method according to one of the preceding claims, characterized in that an array comprising a multiplicity of cells immobilized on different 15 electrodes is prepared, and a multiplicity of substances are tested.

14. Bioelectronic device, comprising:

- a cell which contains a target component,
- a potential-sensitive electrode, the cell being 20 immobilized on the potential-selective electrode and the target component being capable of producing a measurable signal at the electrode, and
- a medium with a salt concentration of \leq 100 mmol/l.

15. Use of the bioelectronic device according to 25 Claim 14 for measuring a signal at the potential-sensitive electrode due to the target component.

16. Use according to Claim 15 for analyzing individual cells.

17. Use according to Claim 15 or 16 as a sensor.

30 18. Use according to one of Claims 15 to 17, characterized in that the change in an ambient parameter is determined as the detectable signal at the electrode.

19. Use according to one of Claims 15 to 18 for 35 determining whether a substance is a modulator of the target component.

20. Method of locating a cell on an array comprising the steps of:
 - (a) preparing a cell, immobilized on an extracellular potential-sensitive electrode, which contains the target component,
 - (b) measuring a signal at the electrode induced by the presence of a cell in a medium which has a salt concentration $\leq 100 \text{ mmol/l}$, and
 - (c) locating the position of the immobilized cell by means of the measurement in (b).
21. Method according to claim 20, wherein the cell is immobilized on an array preferably comprising a plurality of extracellular potential-sensitive electrodes.
22. Method according to claim 20, wherein step (b) comprises a site-specific measurement.